

Original report

24 SEP 1960

MEMORANDUM FOR: Assistant Director/Research and Reports

ATTENTION: Chief, Geographic Division

ATTENTION: Chief, Fuels and Power Branch/Economic Division

SUBJECT: Geographic Analysis of China for Possible Location of Atomic Energy Plants

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1. We, and the other members of the Joint Atomic Energy Intelligence Committee, find ourselves in the awkward position of having reason to believe that the Chinese Communists are actively constructing fissionable material production sites and possibly a weapon test site without having any solid information on where these facilities actually might be. We are reasonably sure, however, that the Chinese would take into account the same general kind of geographic and industrial factors as were used in locating such sites in the US.

2. Therefore, it would be very helpful if your Geographic Division could delineate by 17 October 1960, or as soon thereafter as practicable, the most likely areas of China for these plants based on the criteria set forth below. We have tried to select these criteria by analogy with the US and USSR atomic energy programs. There may well be other criteria not known to us which any Chinese engineer would be expected to use. Such additional normal criteria, if known, may of course be added in making the study.

3. Since electric power availability is one of the major criteria, it is requested that the Fuel and Power Branch of OAS supply the Geographic Division with the locations and estimated amounts of new generating power installed and to be installed in China between 1958 and end 1962, in areas 200 miles or more from southern borders and 100 miles from the coast. We recognize that in many cases part or all of the newly installed generating equipment may be intended to supply new non-atomic industry. Where such is known to be the case, it should be mentioned.

4. Likely areas for three kinds of atomic installations are desired: a reactor site, a gaseous diffusion U-235 separation site, and a nuclear weapons test site. These have three different sets of criteria:

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a. Reactor site:

- (1) Over 100 miles from the coast or 200 miles any alien border (except possibly Outer Mongolia and the USSR).
- (2) At least 600,000 gallons per minute minimum average river flow with a quality of water approaching the Columbia river in having the best realizable minimum of dissolved salt and suspended solids content. The flow site assumes that no more than 1/3 the minimum flow will actually be used and that room for expansion has been allowed for. Water treatment plants allow considerable flexibility in the quality of water, but the criteria of a minimum of water treatment is designed so as to take into account this flexibility.
- (3) In any equal choice between streams, the stream that remains cooler throughout the summer months will be chosen.
- (4) Within 30 miles of existing standard gauge railroad transportation.
- (5) 50 to 150 MW of electric power available over that actually to be required by non-atomic industry, and, preferably, supplyable from more than one source.
- (6) Preferably away from a densely populated area (in case of accident and for security reasons).
- (7) Ready access to gravel and sand for concrete manufacture.

b. Gaseous Diffusion Plant

- (1) Over 100 miles from the coast or 200 miles any alien border (except possibly Outer Mongolia and the USSR).

- 2 -

~~SECRET~~

SUBJECT: Geographic Analysis of China for Possible Location of Atomic Energy Plants

- (2) At least 200,000 gallons per minute minimum average flow of water of a quality which will not require too much treatment to keep heat exchanger tubes from plugging up when operated at well below the boiling point of water.
- (3) Water does not get above 90°F.
- (4) 100-500 MW of excess electric power preferably with backup from other generating stations.
- (5) Within 10-20 miles of an existing standard gauge railroad.
- (6) Local building materials available in quantities sufficient for the construction of very large factory type buildings (i.e., structure covering tens of acres).

c. Nuclear Weapons Test Site

- (1) Arid area
- (2) Within 30 miles of an existing railroad or a good truck highway.
- (3) Drinking water available for peak numbers of 5,000 people.
- (4) Well back in the zone of the interior.
- (5) In an area where during the non-freezing part of the year 60% or better of the air masses passing over the site do not subsequently pass over the heavily populated areas within 1,000 miles of the site.
- (6) The wind patterns are reasonably predictable and not too changeable during the summer months
or
(a) A largely uninhabited island within the defense zone

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- (b) Harbors large vessels can anchor and off load in safety from the seas
- (c) 60% or more of the time during the warmer months air masses from the site travel 1,000 miles or more before passing over heavily populated areas.

b. We are confronted with having to prepare an MLE (13-2-60) on the Communist Chinese atomic energy program by 1 December 1960 and regret the short deadline by that schedule.

HERBERT SCOVILLE, JR.
Assistant Director
Scientific Intelligence

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